



PROJECT FACT SHEET

OMBURU 20 MW PV POWER PLANT

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Introduction and Background

In 2018, Namibia Power Corporation (NamPower) crafted its new [Corporate and Strategic Business Plan](#) for the period 2019-2023. In-line with the new corporate strategy and business plan, the NamPower Board of Directors approved the implementation of new generation projects in June 2018 under the “Strategic Pillar, Ensuring Security of Supply”.

These projects were later considered by the Minister of Mines and Energy and a determination was made in October 2018 by the Minister that 220MW of Power Generation should be developed where:

- 150MW would be allocated to NamPower;
- 70MW would be allocated on a competitive procurement basis as per current government procurement laws to IPPs for implementation.

At a Board Meeting on 8 November 2018, the NamPower Board ratified the implementation of the following projects as part of NamPower’s 150MW allocation.

- 20MW PV Power Project;
- 40MW Wind Power Project;
- 40MW Biomass Power Project; and
- 50MW Firm Power Project.

NamPower is thus advancing the development of its proposed Omburu 20MW20 PV Power Plant. The proposed power plant will be developed as an Engineering Procurement and Construction project and will be owned and operated by NamPower where the majority of the costs for the project will be funded from NamPower’s balance sheet.

NamPower is committed to supporting and achieving the government objectives as set-out in the national planning policies, and in particular the [National Integrated Resource Plan \(NIRP\)](#) and the [5th National Development Plan \(NDP5\)](#).

Considering Namibia’s abundant solar resource coupled with the objectives set out in NIRP as well as NamPower’s strategic roadmap to expand the penetration of renewables within the energy mix; PV power plants are considered ideal for providing energy at competitive tariffs in Namibia.

Project Objectives and Rationale

The key objectives of the Omburu 20MW PV Power Project, also herein after referred to as the “Project”, are to:

- Reduce the overall NamPower tariff to the customer by introducing an affordable “new-build” renewable energy to the Namibian grid;
- Support the commitments made at COP21 to increase the share of renewable energy generation within the country to 70% or more by the year 2030 according to National Renewable Energy Policy of Namibia (July 2017);
- Allow the design of the Project to include provision for the future addition of an Energy Storage System (ESS), once the prices have reduced to an acceptable entry point; and

Allow for a testing area at the Project, where an ESS pilot project can be implemented to assess the full viability of the technology.

SWOT Analysis

The Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis for the Project is summarised in Figure 1.

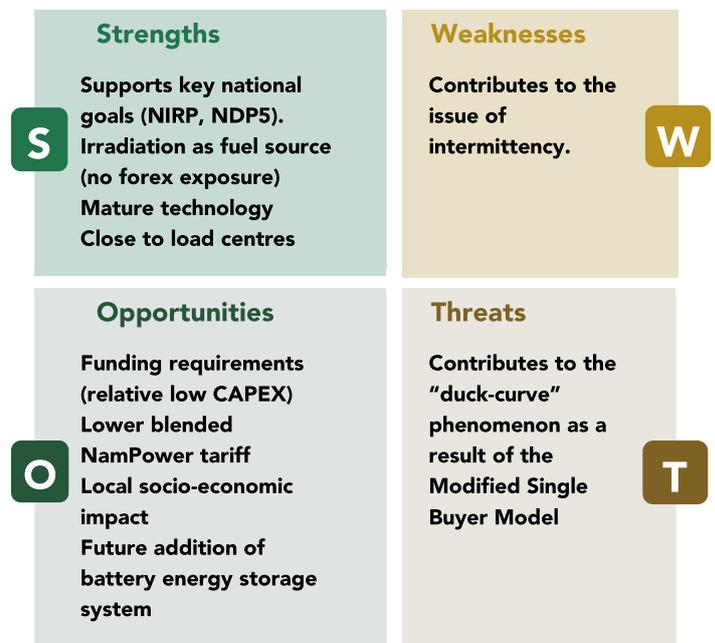


Figure 1: Project SWOT Analysis

Technical Description and Site Details

Although the optimum solar resource in terms of Global Horizontal Irradiance (GHI) for PV is in western Namibia, the vast majority of the country still has a substantially satisfactory solar resource as shown in figure 2.

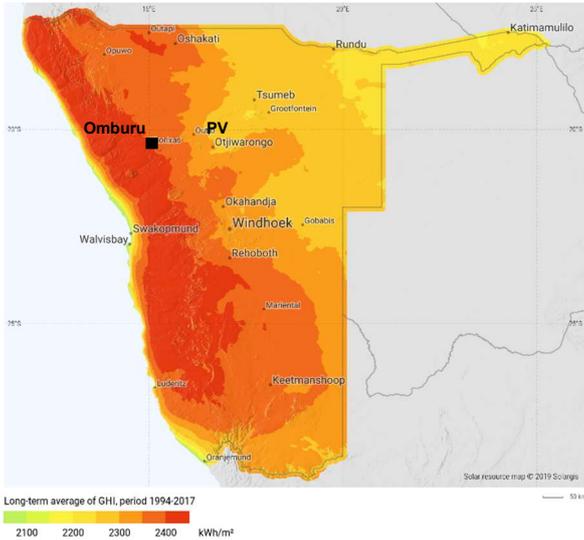


Figure 2: GHI Solar Resource Map of Namibia

The selection of the Project Site was supported through a comprehensive desktop study. The study focused on the need for generation capacity closer to the load centres while reducing the load on the transmission backbone. A Multi-Criteria Decision Making (MCDM) process was used to rank the eight best sites. The Omburu Project Site was considered as the most preferred site.

The 300 ha Project Site which is shown in Figure 3 is situated approximately 12 km south east from the town Omaruru. The Plant will be located within the 100 ha de-bushed shaded area.

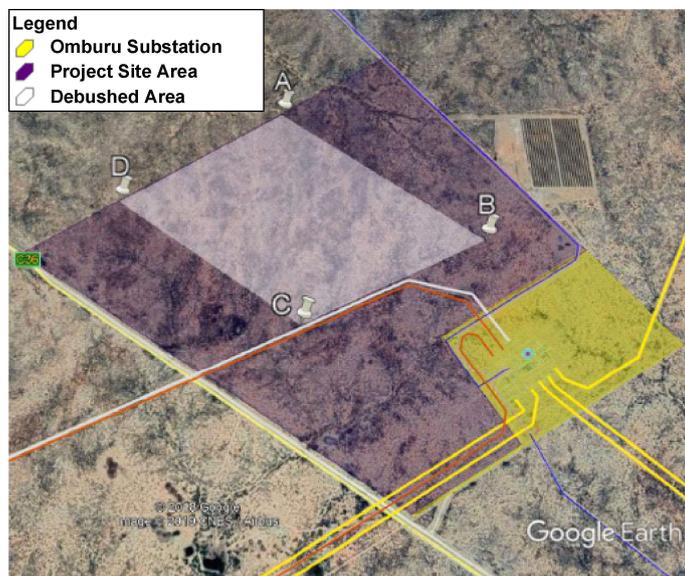


Figure 3: Omburu PV Project site location

The technical description and site details are listed below in Table 1.

Table 1: Location and Description

Location and Description	
Site Area	300 hectares
Coordinates	21°29'21.36"S; 16° 1'14.53"E
Plant Footprint	40-58 hectares
Plant Capacity	20 MW (net)
Planned Commissioning	May 2021
Plant Lifetime	25 years (minimum)
Performance Ratio	~77.5% (minimum)
Capacity Factor	~36% (expected)
DC/AC ratio	1.3 (minimum)
PV module Technology	Silicon Crystalline
PV Mounting Structure	1-axis back-tracking
Cleaning Method	Wet pulverised cleaning

Plant Yield Estimate

The energy yield assessment, which is based on the technical description, was performed by NamPower's Technical Advisor. The assessment provides indicative monthly energy generation figures for the Project as shown in Figure 4. In anticipation of acceptable entry point of market prices for Energy Storage System (ESS), the Plant will be designed for the provisional modular integration of an ESS.

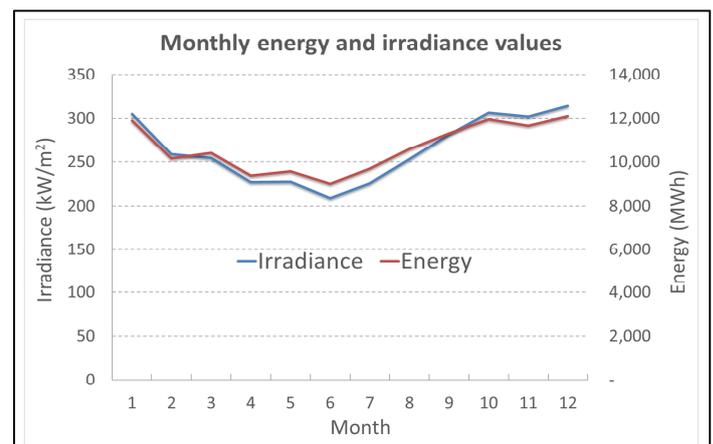


Figure 4: Monthly yield estimate for the Project

Project Structure

The intended project structure is depicted in Figure 5, indicating the key stakeholders involved.

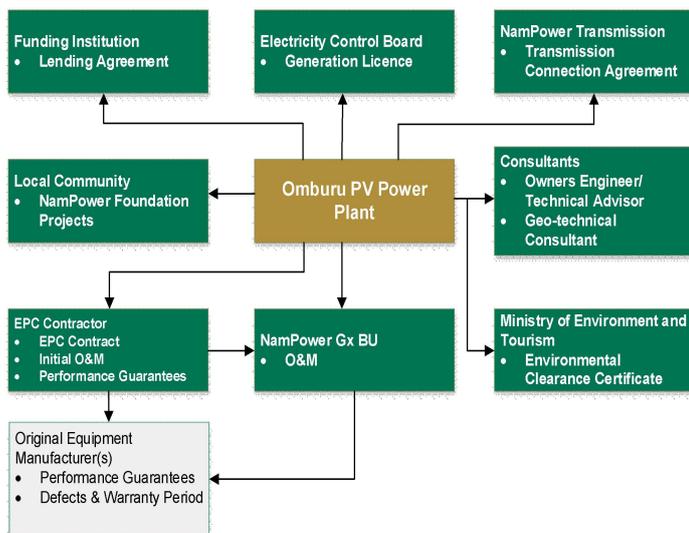


Figure 5: Project Structure

The Omburu PV Power Plant will be developed, owned and operated by NamPower, where NamPower will appoint an EPC contractor to construct the power plant. Figure 5 provides the project structure which illustrates the key stakeholders and the following key agreements:

- Lending Agreement – It is envisaged that the Project will be balance sheet financed, however NamPower may want to lend against its balance sheet to leverage its resources. If NamPower decides to follow this route, a Lending Agreement will be entered into with the respective Funding Institution;
- Generation Licence – NamPower applied for a generation licence from ECB to operate the plant (approval pending);
- Transmission Connection Agreement – NamPower Generation will enter into a Transmission Connection Agreement (TCA) with NamPower's Transmission Business Unit for connection of the power plant to the Namibian grid;
- Consultants – NamPower procured consultants to assist in providing the following specialised knowledge and expertise on the development and execution of the Omburu PV Power Project:
 - Technical Advisor and Owner's Engineer will provide technical support and assistance in managing the EPC contract to NamPower;
 - Geotechnical Consultant assessed the geotechnical, hydrogeological and

topographical conditions for the site in order to mitigate possible subsoil risk.

- EPC Contract – NamPower will procure an EPC Contractor to engineer, procure and construct the power plant through a transparent and open international competitive bidding process. The procurement of the EPC Contractor will follow the Public Procurement Act;

As the envisaged project structure for the Project relies on the Project being procured by NamPower on its balance sheet, a Power Purchase Agreement (PPA) will not be required.

Procurement Methodology

The procurement of an Engineering, Procurement and Construction (EPC) Contractor for the Project will be completed within the provisions of the Namibian Public Procurement Act, No.15 of 2015. This procurement falls above NamPower's threshold, and will therefore be administered through the Central Procurement Board of Namibia (CPBN) on behalf of NamPower.

The contract between NamPower and the successful bidder (EPC Contractor) will be based on the FIDIC Conditions of Contract for EPC/Turnkey Projects (Silver Book), 2017 edition.

The EPC procurement process is an open advertised bidding process through a single stage. The scope of the EPC Contractor will include the following:

- The engineering, procurement and construction of the Project under a turnkey contract (FIDIC Silver Book);
- Provide full turnkey-wrap scope of services, including transportation, insurance, customs and duties and a 2 year Defects Notification Period as per FIDIC;
- Subcontract all possible local works/services to Namibian companies in order to achieve a minimum local content spend of 10% of the total EPC contract value;
- Ensure that all unskilled and semi-skilled labour which are employed are Namibian citizens; and
- Supervise (as required) the O&M of the Plant during the first two years of operation.

Plant Operation and Maintenance

During the Defects Notification Period (DNP), NamPower will undertake the Operation and Maintenance (O&M) of the Omburu PV Power Plant, acting under the supervision and instruction of the EPC Contractor. The EPC Contractor will be responsible to achieve the annual performance guarantees and hence deploy requisite supervision and support services as required in order to meet the annual performance guarantees under the EPC Contract.

NamPower staff will be trained by EPC Contractor personnel to ensure that the necessary knowledge has transferred for the Omburu PV Power Plant to be operated and maintained in a satisfactory manner prior to the Date of Completion.

Environmental Considerations

An Environmental Impact Assessment was completed on the Project Site in 2014 as part of the development works completed for the former 3x10 MW Solar PV Project. The Environmental Clearance Certificate (ECC) for this site was obtained in June 2016. The ECC was therefore updated for the Omburu PV Power Plant and was renewed with the Ministry of Environment and Tourism in January 2019. The ECC will remain valid until January 2022.

Capital Budget

The Project will be corporate financed through NamPower's balance sheet. NamPower's Financial Statements are reported in NamPower's Annual Report, (Investor Relations section of the NamPower website, www.nampower.com.na).

NamPower is seeking corporate funding from institutional lenders and equity investors in order to bring the Project to fruition.

The cost estimates of the Project is N\$ 497,868,000 and is classified as Class-D cost estimates accurate to -20% to +30%. Exchange rates of NAD/USD 14 and NAD/EUR 17 were assumed for the estimate.

Value Proposition

The value proposition of the Project is demonstrated in the cost difference between the energy generated by the Project and the corresponding energy imported from Eskom. The NPV avoided cost of the Project at various discount rates is summarised in Table 2 below.

Table 2: Project Value Proposition

Discount Rate	NPV Avoided Cost
10%	NAD 674,079,635
13%*	NAD 451,245,388
16%	NAD 312,735,164

* The maximum nominal return on asset as allowed by the ECB

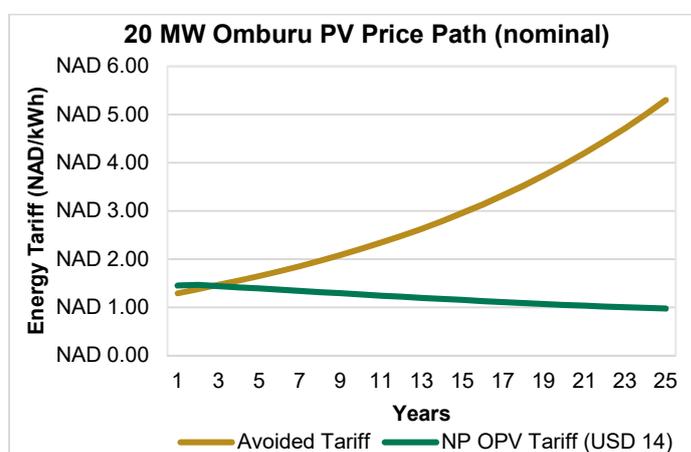


Figure 6: Expected Avoided Tariff

Risk Assessment

In June 2018, NamPower conducted a risk assessment workshop with internal stakeholders to identify all the anticipated Project risks in terms of discipline (i.e. environmental, commercial, legal and technical) and in terms of each project phase (i.e. procurement, construction and operation). The high-priority risks identified during the development activities of the Project are listed as follows:

- New procurement process creates delays;
- Bids received will be required to be fixed in NAD.

A risk assessment workshop will be held with the EPC contractor to update the risk register for the construction and operation phases of the Project.

Project Schedule and Progress

The following next steps are required to bring the project to its execution phase:

Table 3: Key Next Steps for the Project

Key Next Steps
Obtain a generation license from ECB for the Project
Conclude Procurement of the EPC Contractor
Commence with construction of the PV plant

The completed tasks of the Project are summarised in Table 4.

Table 4: Project Completed Tasks

Completed Tasks	Completion Date
NamPower Board approval of Project Business Case	Aug 2018
NamPower Board and Ministerial approval on final Project capacity	Nov 2018
FIDIC Approval by MoF	Feb 2019
Procurement of Geotechnical Consultant	Feb 2019
Individual Procurement Plan Approved by CPB	Jun 2019
Standard Bidding Documents Approved by PPU	Jun 2019
Finalisation of Geotechnical Study	Jul 2019
Standard Bidding Documents Approved by CPB	Aug 2019
Bidding Documents issued to market	Oct 2019
Submit Gx Licence Application to the Electricity Control Board (ECB)	Oct 2019
Closing date for Bid	Feb 2020

Project Key Milestones

The key milestones of the Project are summarised in Figure 7.

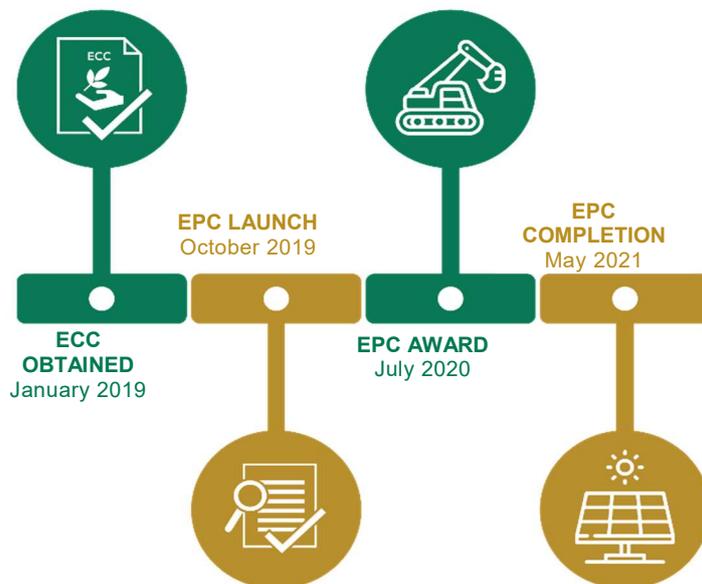


Figure 7: Project Development Timeline

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